56th Annual Gaseous Electronics Conference
October 21-24, 2003
NASA Ames Research Center
San Francisco, California

THIRD AND FINAL ANNOUNCEMENT

August 2003

The Fifty-Sixth Annual Gaseous Electronics Conference (GEC) will be held October 21-24, 2003 in the conference facilities of the Cathedral Hill Hotel in downtown San Francisco, California.

The GEC Executive Committee invites papers on basic phenomena and plasma processes in partially ionized gases, and on the theory and measurement of basic atomic and molecular collision processes. Papers reporting on experimental, theoretical, and computational studies which address either fundamental properties of low-temperature plasmas, or their applications, are encouraged. Applications of interest include, but are not limited to, plasma processing of materials, gas lasers, ion sources, gas discharge lamps, plasma chemistry, plasma-surface interactions, ionospheric phenomena, diagnostics, and similar topics. Although most papers will deal with low-energy processes, papers that concern electronic or radiative processes produced by high-energy electrons or heavy particles are also welcome.

IMPORTANT DEADLINES:

Post-deadline abstracts:	Aug. 22, 2003
Early registration:	Aug. 22, 2003
Conference hotel reservation:	Sept. 18, 2003

THERMAL PLASMA WORKSHOP

A thermal plasma workshop will be held on Thursday, October 23, 2003, 11:30 am to 1:30 pm. All GEC attendees are invited to attend the workshop and participate in the discussion. A box lunch will be available for purchase. A special emphasis of this workshop will be plasma modeling, with an invited presentation by Armelle Vardelle, ENSIL and University of Limoges, on "Three-dimensional, time-dependent models of thermal arcs." The purpose of the workshop will be to compare different approaches for theoretical descriptions of so-called thermal plasmas and the relative merits of each of the approaches, as well as the associated numerical simulation techniques. A further purpose is to raise interest in unresolved issues that ask for creative approaches in further research. If you are interested in presenting at this workshop, please submit an abstract to:

Joachim Heberlein
High Temperature and Plasma Laboratory
University of Minnesota
Minneapolis, MN 55455
jvrh@me.umn.edu
Tel. (612) 625-4538 Fax (612) 625-4344

SPECIAL SESSION: PLASMA ETCHING IN THE SEMICONDUCTOR INDUSTRY

A special session will be held to highlight the present state of the art in plasma etching as it pertains to the semiconductor industry. This session will have a special format where a select number of talks will focus on the present technologies and challenges of semiconductor etching processes and how the plasma research community can contribute to furthering the state of the art. A discussion period will follow, giving all audience members a chance to question the speakers and discuss issues. All GEC participants are invited to attend.

POST-DEADLINE ABSTRACT SUBMISSION

Submission of late abstracts is still possible on a limited basis. Post-deadline contributions will only be considered for posters. Abstracts must be submitted by August 22, 2003 to be considered. Accepted abstracts will be published in the APS Bulletin. To submit a post-deadline abstract, please go to: http://abstracts.aps.org, click on "submit an abstract", and select 2003 GEC Post-Deadline.

REGISTRATION

The deadline for early registration is August 22, 2003. Online registration is preferred. Please register at **http://www.123signup.com/register?id=jtxq**. The link to the registration website is also available from the GEC website (http://gec2003.arc.nasa.gov). You may pay by credit card (Visa or MasterCard), or mail in a check in US funds. If you cannot register online, please contact the conference secretary for a form that can be mailed or faxed.

REGISTRATION FEES*

	Early (before August 22, 2003)	Late (after August 22, 2003)
Regular attendee	$255	$310
Student/Retiree (includes banquet)	$140	$190
Banquet dinner	$40	$40

*Fee includes opening reception, refreshment breaks, and conference materials. Banquet dinner is included for students and retirees.

Checks should be mailed to the following address. Please be sure to include the exact amount in US funds, and include your name, mailing address, phone number, and email address.

GEC 2003 Registration
% Marcia Redmond
NASA Ames Research Center
Mail Stop 258-6
Moffett Field, CA 94035 USA
FAX: (650) 604-4377

ACCOMMODATIONS

The conference will be held at the Cathedral Hill Hotel in downtown San Francisco, California. A block of rooms has been reserved at the Cathedral Hill Hotel for conference participants, providing the most convenient accommodations for the conference. The hotel is within walking

distance of numerous attractions and restaurants in San Francisco. Please see the hotel's website for a map of the hotel's location. A link to the hotel's website can also be found on the conference website, http://gec2003.arc.nasa.gov. Room rates and contact information for the hotel are shown below. Conference participants must make their own reservations directly with the hotel. **Be sure to mention the Gaseous Electronics Conference when you make your reservation to insure that you get the conference rate**. **The deadline for making reservations at the conference rate is September 18, 2003**. After September 18, the conference rates are no longer guaranteed. For those who wish to extend their stay, the conference rates listed below are available from October 18 through October 25, 2003.

IMPORTANT NOTE: Please note that October is a busy month for the Cathedral Hill Hotel and the GEC room block is limited. Please make your reservation early since the availability of rooms cannot be guaranteed EVEN BEFORE SEPTEMBER 18 if the room block is filled.

Cathedral Hill Hotel–GEC 2003 Conference Site
http://www.cathedralhillhotel.com
1101 Van Ness Ave.
San Francisco, CA 94109
Phone: (415) 776-8200 or 1-800-622-0855, Fax: (415) 441-2841,
e-mail reservations@cathedralhillhotel.com

$150 single or double, +$10 for each additional person. Rates do not include a 14% occupancy tax.

TRAVEL

Conference participants arriving by air can fly into the San Francisco International Airport (code SFO), which is served by all major airlines. The airport is about 15 miles from the conference hotel in downtown San Francisco. Other airports that may offer cheaper airfares are Oakland International (OAK) and San Jose (SJC). Taxi fare from SFO is approximately $37 one-way. Shuttle service, such as through Super Shuttle (http://supershuttle.com), costs $12.50 one-way from SFO to the Cathedral Hill Hotel. Discounts for shuttle service can be obtained from http://www.baycityguide.com/images/coupons_pdf/wc_transportation.pdf. Another option is to take The Bay Area Rapid Transit system (BART), which now connects SFO to downtown SF, and the hotel is a short taxi or bus ride from the BART station. For further information about BART from SFO, please see http://www.bart.gov/docs/BARTSFOflyer.pdf. **Rental cars are not recommended, as traffic and parking in San Francisco are difficult and expensive.** For guests of the Cathedral Hill Hotel parking is available at a daily rate of $17, including in and out privileges. Parking for conference attendees is available in the hotel garage, with limited parking, at a daily rate of $8. We strongly encourage local attendees to carpool or take public transportation.

BART directions: In the airport (SFO), follow the signs in the airport to the BART station, located beyond the International Terminal G. A one-way fare costs $4.70. Take BART and exit at the Powell St. station. Climb the stairs up to the NW corner of Geary Blvd. and Powell St., and take the 38L Muni (bus) headed north. Bus fare is $1.25. Get off at corner of Geary Blvd. and Van Ness Ave., which is the location of the Cathedral Hill Hotel.

BANQUET AND RECEPTION

An opening reception will be held on the evening of Monday, October 20, 2003, in the Cathedral Hill Hotel, starting at 7:00 p.m. A banquet will also be held at the Cathedral Hill Hotel on Thursday evening, October 23. Conference participants are encouraged to attend the reception and the banquet.

THE GEC FOUNDATION TALK

The Executive Committee is pleased to announce the Foundation Talk at the 2003 GEC:

John Coburn, *University of California, Berkeley,* The evolution of plasma etching in micro-electronic manufacturing

The GEC Foundation Talk is a plenary talk at each GEC. Its aim is to present a cogent overview of a topical area and to put it into context for the very cross-disciplinary audience that attends the GEC. The talk covers both introductory material to guide students and newcomers, as well as cutting edge work from the speaker's own experience to engage the expert.

EXHIBITORS

Once again this year we will be making arrangements to host exhibitors of products of interest to the GEC community. A list of conference exhibitors will be provided at the conference. Firms interested in exhibiting at the conference should contact the Conference Secretary for a registration form.

STUDENT TRAVEL SUPPORT

The GEC remains committed to supporting student participation at the Conference. Many outstanding scientists and engineers have given their first professional technical presentation at a GEC. Because of the increased travel costs associated with staying in San Francisco, the Executive Committee has decided to increase the level of student travel support for this year, in both the number of students supported, as well as the travel grant amount per student. This year, we are supporting a total of 31 students, the most ever in GEC history, for a total of over $18,000. We thank the advisors for supporting their students' involvement in the Conference.

STUDENT AWARD FOR EXCELLENCE

In 1998, the GEC initiated the Student Award for Excellence to recognize an outstanding technical presentation at the conference given by a student. The winner is chosen by members of the Executive Committee who attend the presentations, based on technical merit and quality of the presentation. The winner will be announced at the Conference Banquet and will receive a certificate and an award for $500.

We encourage all GEC participants to attend the finalists' talks. This year, the finalists for the Student Award for Excellence are:

> Kathleen De Bleecker, University of Antwerp, "Numerical Investigation of Growth Mechanisms of Cluster in a Silane Capacitively Coupled RF Discharge", Tuesday 9:00 am.

Zviad Tsakadze, Nanyang Technological University, "PECVD of Self-Assembled Ordered Carbon Nanotip Arrays in High Density Inductively Coupled Plasmas", Tuesday 11:00 am.

Hyun Chul Kim, Pohang University of Science and Technology, "Effective Frequency Concept for Dual Radio-Frequency Discharges", Tuesday 11:30 am.

Paul Boyle, Dublin City University, "Analytical Model of a Dual Frequency Capacitive Sheath", Tuesday 4:15 pm.

Nicolas Bulcourt, École Polytechnique, "UV Absorption Spectrum of the radical CF_2 in an $Ar/C_4F_8/O_2$ Dual Frequency Capacitive Discharge", Wednesday 8:00 am.

Dragana Maric, University of Belgrade, "Study of pd and j/p^2 Scaling in Abnormal Glow Discharges in Argon", Thursday 8:00 am.

FUTURE CONFERENCES

The 57th Annual Gaseous Electronics Conference will be held in Bunratty, Ireland. The Conference Secretary is Prof. Bill Graham from Queen's University Belfast. The conference will be held Sunday, September 26 to Wednesday, September 29, 2004. Please note that this is a departure from the usual conference schedule, and make your travel plans accordingly. Contact Professor Graham at b.graham@qub.ac.uk.

The General Committee is accepting bids to host conferences for 2005 and beyond. A bid consists of a specific year for the location, a conference location (city and facility, such as a hotel or conference center), tentative budget, and description of resources and people to organize and host the conference. If you are interested in preparing and submitting a bid, please contact the GEC Chair for more information.

The Executive Committee encourages you to make suggestions or to join the committees that choose the location of the conference and to organize it. Please contact the GEC Chair (Lepsha Vuskovic, vuskovic@physics.odu.edu) for ideas about:

Hosting a future GEC,
Suggesting invited speakers, session topics, workshop ideas, etc.,
Nominate yourself or others for the GEC General Committee,
Any comments about the GEC in general.

GEC INFORMATION ONLINE

The official website for the GEC 2003 conference is http://gec2003.arc.nasa.gov. This website will contain the most detailed and up-to-date information on the conference. Sign-up to an automated mailing list is available through the website. Through this mailing list, further announcements and deadline reminders will be sent by e-mail. You may also sign-up by sending email to the following address with the word "subscribe" in the subject line: gec2003-request@lists.arc.nasa.gov.

Additional information may also be obtained from the American Physical Society website at http://www.aps.org. The GEC maintains a permanent website at http://www.gec.org.

CONFERENCE SECRETARY

Further information on the conference may be obtained from the Conference Secretary at the following address:

Dr. Helen Hwang
NASA Ames Research Center
Mail Stop 230-3
Moffett Field, CA 94035-1000

Voice: (650) 604-1368, Email: gec@dm1.arc.nasa.gov

SESSIONS AND INVITED SPEAKERS

Monday, October 20, 2003

AM (19:00): Reception and Registration

Tuesday, October 21, 2003

BT1 (8:00): Dusty Plasmas

BT2 (8:00): Atmospheric Pressure Glow Discharges

CT1 (10:00): Carbon Nanotube Growth
M. Meyyappan, *NASA Ames Research Center,* "Low temperature plasmas in carbon nanotube growth and functionalization"

Otto Zhou, *University of North Carolina,* "Carbon nanotubes as robust electron field emitters in gaseous and vacuum environments"

CT2 (10:00): Capacitively Coupled Plasmas

DTW (11:45): Special Session: Trends in Plasma Etching

ET1 (13:15): Biological Applications of Plasmas I
Eva Stoffels, *Eindhoven University of Technology,* "Plasma needle: treatment of living cells and tissues"

Kenneth Stalder, *Stalder Technologies and Research,* "Plasma Characteristics of Electrosurgical Discharges"

Zoran Petrovic, *Institute of Physics, Belgrade,* "Application of non-equilibrium plasmas in treatment of wool fibers and seeds"

ET2 (13:15): Inductively Coupled Plasmas

FT1 (15:30): Plasma Sheaths

FT2 (15:30): Plasma Chemistry

GTP (19:15): Poster Session I
Inductively Coupled Plasmas; Material Processing I; Instabilities in Reactive Discharges; Computational Methods for Plasmas; Plasma Dynamics; Ozone Production; Lighting Plasmas I; Transport Coefficients; Glows; Capacitively Coupled Plasmas; Diagnostics I; Electron Collisions

Wednesday, October 22, 2003

HW1 (8:00): Diagnostics I

HW2 (8:00): Nanostructures and Nanoparticles
Masaharu Shiratani, *Kyushu University,* "Silicon nano-structure formation using plasma under micro-G and one G conditions"

JW (10:00): GEC Foundation Talk
James Coburn, *University of California, Berkeley,* "The Evolution of Plasma Etching in Integrated Circuit Manufacturing"

KW (11:15): GEC Business Meeting

LW1 (13:15): Atomic Ionization
Michael Schulz, *University of Missouri-Rolla,* "Three-Dimensional Imaging of Ionization Processes"

LW2 (13:15): Innovative Applications of Discharges

MW1 (15:30): Lighting I
Gerrit Kroesen, *Eindhoven University of Technology,* "Behavior of metal halide lamps under microgravity and hypergravity conditions "

MW2 (15:30): Material Processing I
Richard Gottscho, *Lam Research Corporation,* "Why we need more tuning knobs in plasma etching—and what knobs work best"

Gilles Cunge, *Laboratoire des Technologies de la Microélectronique, Grenoble*, "Plasma-walls interaction and process drifts during silicon gate etching processes"

NWP (19:15): Poster Session II
Diagnostics II; Collisional Ionization; Lighting Plasmas II; High Pressure Discharges; Plasma Sheaths; Plasma Propulsion; Nanotechnology; Negative Ion Plasmas; Magnetically-enhanced Plasmas

Thursday, October 23, 2003

PR1 (8:00): Rydberg Plasmas and Highly Excited Atoms
Daniel Vrinceanu, *Harvard-Smithsonian Center for Astrophysics,* "Electron impact ionization of Rydberg atom"

Phillip Gould, *University of Connecticut,* "Ultracold Rydberg Gases and Plasmas"

PR2 (8:00): Glows

QR1 (10:00): Electron Scattering
Stephen J. Buckman, *Australian National University,* "Collisions with Laser-Cooled, Metastable Helium Atoms"

QR2 (10:00): Environmental Applications
Antoine Rousseau, *Université Paris Sud,* "Abatement of atmospheric pollutants by plasma-catalysis association"

RRW (11:30): Thermal Plasma Workshop
Armelle Vardelle, *University of Limoges,* "Three-dimensional, time-dependent models of thermal arcs"

SRP (13:30): Poster Session III
Modeling of Glows; Diagnostics III; Electron Scattering from Atoms; Recombination; Biological Applications of Plasmas; High Pressure Plasma Chemistry and Environmental Applications; Laser Kinetics; Dusty Plasmas; Plasma-Surface Interactions; Material Processing II; Innovative Applications of Plasmas; Post-deadline posters

TR1 (15:30): High Pressure Discharges and Arcs
Kunihide Tachibana, *Kyoto University,* "Spatiotemporal Diagnostics of Excited and Reactive Species in High Pressure Discharges"

Richard Miles, *Princeton University,* Neutral "Gas Temperature Measurement by Incoherent and Coherent Rayleigh Scattering"

TR2 (15:30): Fluorocarbon Etch Mechanisms

UR (18:00): Reception and Banquet

Friday, October 24, 2003

VF1 (8:00): Biological Applications of Plasmas II
Birgit Lohmann, *Griffith University,* "Electron impact ionization of water molecules"

Simon Pimblott, *University of Notre Dame,* "Ultrafast reactions of energetic species produced by ionizing radiation"

VF2 (8:00): Magnetically-enhanced Plasmas

WF1 (10:00): Diagnostics II

WF2 (10:00): Lighting II
Dirk Uhrlandt*, Institut für Niedertemperatur-Plasmaphysik, Greifswald*, "Low-Pressure Xenon Positive Column Plasmas for Lighting Purpose: a Model Investigation"

Klaus Bartschat, *Drake University,* "Calculations of Electron Collision Cross Sections for Lighting Applications"

XF1 (13:15): Scattering from Molecular Targets
Thomas M. Miller, *Air Force Research Laboratory,* "New techniques in the study of ion processes in weak plasmas"

XF2 (13:15): Material Processing II
Hong-Young Chang, *Korea Advanced Institute of Science and Technology*, "Plasma Parameter Control Mechanism in plasma sources"

James Bradley, *University of Manchester Institute of Science and Technology*, "Understanding pulsed magnetron plasma processes through time–resolved measurement"